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EXAMINER

MCCOMMAS, STUART S

ART UNIT	PAPER NUMBER
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2629

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/532,254	Applicant(s) SPEIRS, CHRIS	
	Examiner Stuart McCommas	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5 and 7-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-5, 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi et al. (United States Patent 6,907,314), hereinafter referenced as Negishi, in view of Liang (WO 01/54108 A1), hereinafter referenced as Liang, and further in view of Okuzono et al. (United States Patent Application Publication 2001/0043178), hereinafter referenced as Okuzono.

Regarding claim 1, Negishi discloses a display device comprising:

a plurality of pixels arranged in an array having n rows and m columns (figure 4),
each of said pixels comprising a switching element having a gate (figure 4);

a plurality of control lines each connected to the gates of a corresponding row of said pixels and a plurality of data lines, each connected to the switching elements of a corresponding column of said pixels (figure 4);

a row driver circuit (10) that scans the n rows by means of a row voltage applied to said gate of said switching element (figure 4; figure 8);

a column driver circuit that controls the m columns by applying a column voltage to the data lines, said column voltage corresponding to image data of the pixels of selected row to be displayed (column 10 lines 34-51; figure 4).

However Negishi fails to disclose draining one of said control lines down to a given reference voltage, storing the drained charge as a stored charge, and charging another of said control lines to a given scan voltage using the stored charge, wherein the row driver circuit is arranged to drain said control lines by an intermediate draining of a charge from a selected one of the control lines down to an intermediate voltage level and storing the drained charge, followed by a final draining down of a remaining charge from the selected one of the control lines, said final draining including connecting of the selected one line to a common reference voltage, said final draining ending at a time T relative to said intermediate training, and wherein said row driver circuit is arranged to perform said charging by an intermediate charging, beginning at a time not earlier than T , of said another selected one of the control lines to said intermediate voltage level, said intermediate charging using said stored charge, followed by a final charging of said another selected one of the control lines to said scan voltage.

In a similar field of invention Liang discloses draining one of said control lines down to a given reference voltage (V_{to}), storing the drained charge as a stored charge, and charging another of said control lines to a given scan voltage using the stored charge (page 10 lines 25-31; page 11 lines 1-19), wherein the row driver circuit is arranged to drain said control lines by an intermediate draining (t_0 - t_1) of a charge from a selected one of the control lines down to an intermediate voltage level and storing the drained charge, followed by a final draining down of a remaining charge from the selected one of the control lines (t_1 - t_3), said final draining including connecting of the

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selected one line to a common reference voltage, said final draining ending at a time T relative to said intermediate training (page 10 lines 25-31; page 11 lines 1-19; figure 5), and wherein said row driver circuit is arranged to perform said charging by an intermediate charging (figure 5), of said another selected one of the control lines to said intermediate voltage level, said intermediate charging using said stored charge, followed by a final charging of said another selected one of the control lines to said scan voltage disclosed in page 4 lines 1-33 and in page 5 lines 1-5 and in page 10 lines 25-31 and in page 11 lines 1-19 and exhibited in figure 1 and in figure 3 and in figure 5.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Negishi with Liang by specifically providing draining one of said control lines down to a given reference voltage, storing the drained charge as a stored charge, and charging another of said control lines to a given scan voltage using the stored charge, wherein the row driver circuit is arranged to drain said control lines by an intermediate draining of a charge from a selected one of the control lines down to an intermediate voltage level and storing the drained charge, followed by a final draining down of a remaining charge from the selected one of the control lines, said final draining including connecting of the selected one line to a common reference voltage, said final draining ending at a time T relative to said intermediate training, and wherein said row driver circuit is arranged to perform said charging by an intermediate charging, of said another selected one of the control lines to said intermediate voltage level, said intermediate charging using said stored charge, followed by a final charging of said

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another selected one of the control lines to said scan voltage for the purpose of providing a display that saves power by using charge sharing (page 4 lines 13-20).

In a similar field of invention Okuzono discloses that after a time T when a first line is finished scanning, charging by an intermediate charging, beginning at a time not earlier than T, of said another selected one of the control lines to said intermediate voltage level, and then finally charging said another selected one of the control lines to said scan voltage (paragraphs 57-76; figure 3; figure 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Negishi with Okuzono by specifically providing charging by an intermediate charging, beginning at a time not earlier than T, of said another selected one of the control lines to said intermediate voltage level, and then finally charging said another selected one of the control lines to said scan voltage for the purpose of providing a display that waits for the discharge of a previous line before charging the subsequent line to improve the quality of the display (paragraph 28).

Regarding claim 2, Negishi, Liang and Okuzono, the combination discloses everything as applied above, further Liang discloses wherein the row driver is arranged to perform the intermediate draining as a staged intermediate draining (figure 5), comprising a first intermediate draining of a charge from the selected one of the control lines down to a first intermediate voltage level, and a storing of the drained charge as a first stored charge, followed by second intermediate draining of a charge from the selected one of the control lines down to a second intermediate voltage level, and a storing of the drained charge as a second stored charge (page 10 lines 7-31; page 11

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lines 1-13; figure 5), and wherein the row driver is arranged to perform the intermediate charging as a successive intermediate charging (figure 5), comprising a first intermediate charging of the selected another of the control lines using the first stored charge, followed by a second intermediate charging of the selected another of the control lines using the second stored charge disclosed in page 4 lines 9-19 and in page 10 lines 7-31 and in page 11 lines 1-13 and exhibited in figure 3 and in figure 5.

Regarding claim 4, Negishi and Liang, the combination discloses everything as applied above (see claim 1), further Liang discloses wherein the column voltage ranges up to a maximum column voltage and said maximum column voltage is the intermediate voltage level disclosed in page 8 lines 21-33 and in page 17 lines 15-25 and exhibited in figure 2 and in figure 5.

Regarding claim 5, Negishi, Liang and Okuzono, the combination discloses everything as applied above, further Liang discloses that the intermediate row voltage is half of the scan voltage disclosed in page 4 lines 13-19 and exhibited in figure 2 and in figure 5.

Regarding claim 7, claim 7 is interpreted and thus rejected for the reasons set forth above in the rejection of claims 1 and 2. Claims 1 and 2 describe an apparatus and claim 7 describes a method for implementing that apparatus. Thus claim 7 is rejected.

3. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi in view of Liang and Okuzono and further in view of Cairns et al. (United States Patent Application Publication 2002/0126083), hereinafter referenced as Cairns.

Regarding claim 8, Negishi, Liang and Okuzono, the combination discloses everything as applied above, further Liang discloses the intermediate draining (figure 5) and Okuzono discloses the intermediate charging (figure 3; figure 5), however the combination fails to disclose a programmable image repetition rate unit, wherein the programmable image repetition rate unit adjusts an image repetition rate of the display device, and provides an input to the row driver circuit to prevent the row driver circuit from performing scanning of the display when the image repetition rate of the display devices exceeds a predetermined threshold.

In a similar field of invention Cairns discloses a programmable image repetition rate unit (figure 3), wherein the programmable image repetition rate unit adjusts an image repetition rate of the display device (paragraph 88), and provides an input to the row driver circuit to prevent a row driver circuit from performing scanning of the display when the image repetition rate of the display devices exceeds a predetermined threshold (paragraphs 53-63; paragraph 88; figures 3-5).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Negishi and Liang and Okuzono with Cairns by specifically providing a programmable image repetition rate unit, wherein the programmable image repetition rate unit adjusts an image repetition rate of the display device, and provides an input to the row driver circuit to prevent the row driver circuit from performing scanning of the display when the image repetition rate of the display devices exceeds a predetermined threshold for the purpose of saving power by modifying the refresh rate according to the image to be displayed.

Regarding claim 9, Negishi, Liang and Okuzono, the combination discloses everything as applied above, further Liang discloses the intermediate draining (figure 5) and Okuzono discloses the intermediate charging (figure 3; figure 5), however the combination fails to disclose measuring an image repetition rate of the display device and preventing the scanning of the display when the image repetition rate of the display device exceeds a threshold.

In a similar field of invention Cairns discloses measuring an image repetition rate of the display device and preventing the scanning of the display when the image repetition rate of the display device exceeds a threshold (paragraphs 53-63; paragraph 88; figures 3-5).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Negishi and Liang and Okuzono with Cairns by specifically providing measuring an image repetition rate of the display device and preventing the scanning of the display when the image repetition rate of the display device exceeds a threshold for the purpose of saving power by modifying the refresh rate according to the image to be displayed.

Response to Arguments

4. Applicant's arguments have been fully considered but they are not persuasive.

On pages 7-8 of Applicant's remarks, Applicant argues that there is no intermediate charging disclosed in Okuzono.

The Examiner respectfully disagrees, because Okuzono discloses the intermediate charging of the scan line $n+1$ that occurs after the first scan line n has

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been fully discharged in figures 3 and 5, where the scan line $n+1$ is charged to an intermediate or middle voltage and then charged fully to the final voltage in both of the figures. Simply because there is no teaching of the gate lines being connected and sharing charge does not mean that the timing of the signals in Okuzono is not the same as the timing in the claimed invention.

On page 8 of Applicant's remarks, Applicant argues that there is no basis for combining Liang with additional art to arrive at the claimed invention, because Liang expressly teaches simultaneous charging and discharging of the display.

The Examiner respectfully disagrees, because Negishi discloses the fundamental structure of the display, and Liang discloses the concept of intermediate charge sharing between display lines using scanning signals, and Okuzono discloses the specific timing of the scanning signals. Further Okuzono discloses that one scan line must finish scanning before scanning the next scan line, where the timing of the scan signals is delayed or staggered by a time A so that horizontal lines do not appear on the display to improve the quality of the display (paragraphs 67-68; figure 4). The Examiner believes that it would be obvious to one of ordinary skill in the art to combine the specific method of charge sharing provided by Liang and the timing of the display signals provided by Okuzono with the structure and method of Negishi to improve the performance of the display. While Liang discloses the simultaneous charge sharing and scanning, Okuzono discloses the concept of sequential scanning and the timing as described in the claim. Having the voltage transitions occur one after the other, as opposed to simultaneously, would not render the combination inoperative or unobvious because the

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charge could be stored and used in the same manner to achieve the power saving features indicated. This combination would thus be obvious to one of ordinary skill in the art, and is a valid combination.

Conclusion

5. **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stuart McCommas whose telephone number is (571)270-3568. The examiner can normally be reached on Monday-Friday 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alex Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SSM

/Alexander Eisen/

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